

A channel geometry for monolith and honeycomb catalysts used in two- and three-phase catalytic reactions or gas-liquid mass transfer processes features a desirable channel shape that enhances liquid/structure contacting efficiency and gas/liquid catalytic reaction activity. Gas/liquid catalytic hydrogenation or hydrotreating processes carried with these catalysts use efficient liquid/channel surface contacting and mass transfer of reactants from bulk liquid onto the channel surface to achieve high conversion efficiencies.